layer has a dielectric constant at zero bias voltage ranging from 30 to 2000.

18. (Once amended) The device according to claim 1, wherein the a finline substrate comprises:

a low loss, low dielectric material.

REMARKS

Reconsideration of this application is respectfully requested in light of the above amendments and following remarks. Claim 3 has been cancelled without prejudice or disclaimer. Claims 1, 2, and 4-18 have been amended to expedite the issuance of claims of particular current licensing interest. Claims 1, 2, and 4-18 are pending in this application. Claim 1 is the independent claim.

I. The Indefiniteness Rejection

Claims 1 -18 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. This rejection is respectfully traversed.

In response, claims 1, 2, and 4-18 have been broadened to recite a "device". Thus, reconsideration and withdrawal of this rejection is respectfully requested.

II. The Anticipation Rejection

Claims 1, 4, and 13 were rejected as anticipated under 35 U.S.C. §102(b). In support of the rejection, Vandik (article titled "Ferroelectric Tuning of Planar and Bulk Microwave Devices") was cited. This rejection is respectfully traversed.

Claim 1, from which claims 4 and 13 depend, recites "the first and second conductors being separated to form a gap having a minimum width ranging from 2 micron to 50 micron." Vandik does not disclose expressly or inherently "the first and second conductors being separated to form a gap

having a minimum width ranging from 2 micron to 50 micron." Accordingly, it is respectfully submitted that the rejection of claim 1 is unsupported by Vandik and should be withdrawn.

III. No Prima Facie Case of Obviousness Has Been Presented

Claims 2, 3, 5-12, and 14-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Vandik, either alone or in combination with Conti (U.S. Patent No. 4,777,654), or Bates (EP Patent Application No. 0050393). This rejection is respectfully traversed.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *See* MPEP § 2143.

Each of claims 2, 3, 5-12, and 14-18 depends from claim 1, which recites "the first and second conductors being separated to form a gap having a minimum width ranging from 2 micron to 50 micron." None of the cited references disclose expressly or inherently "the first and second conductors being separated to form a gap having a minimum width ranging from 2 micron to 50 micron."

Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

It is respectfully submitted that, in view of the foregoing amendment and remarks, the application is in clear condition for allowance. Reconsideration, withdrawal of all grounds of rejection, and issuance of a Notice of Allowance are earnestly solicited.

The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. 1.16 or 1.17 to Deposit Account No. 50-1481. The Examiner is invited to contact the undersigned at 434-972-9988 to discuss any matter regarding this application.

Respectfully submitted,

Date: 19 Oct 2007

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APPENDIX
Marked-up Paragraphs and Claims Showing the Changes Made by Amendment

IN THE CLAIMS:

The claims have been amended as follows:

1. A ~~tunable phase shifter~~ device comprising;

a waveguide;

a finline substrate positioned within the waveguide;

a tunable dielectric layer positioned on the finline substrate;

a first conductor positioned on the tunable dielectric layer; and

a second conductor positioned on the tunable dielectric layer, the first and second conductors being separated to form a gap having a minimum width ranging from 2 micron to 50 micron.

2. ~~A tunable phase shifter~~ The device according to claim 1, wherein:

the gap extends from a first end of the tunable dielectric layer to a second end of the tunable dielectric layer;

the gap includes a first end, a center portion and a second end; and

the gap includes exponentially tapered portions adjacent to said first and second ends.

3. (Cancelled) A tunable phase shifter according to claim 2, wherein the gap has a minimum width ranging from 2 micron to 50 micron.

4. The device ~~A tunable phase shifter~~ according to claim 1, further comprising:

a voltage source for applying a control voltage between the first conductor and the second conductor.

5. The device ~~A tunable phase shifter~~ according to claim 1, wherein the second conductor forms an RF ground.

6. The device ~~A tunable phase shifter~~ according to claim 1, wherein the second conductor comprises:

an RF choke.

7. The device ~~A tunable phase shifter~~ according to claim 1, wherein the waveguide includes first and second sections, and the tunable phase shifter further comprises:

a first conductive plate positioned between the first and second sections of the waveguide; and

a second conductive plate positioned between the first and second sections of the waveguide, the first conductive plate being insulated from the waveguide and the second conductive plate being electrically connected to the waveguide.

8. The device ~~A tunable phase shifter~~ according to claim 7, further comprising an impedance matching section formed by a gap between the first and second conductive plates.

9. The device ~~A tunable phase shifter~~ according to claim 8, wherein the impedance matching section comprises:

an exponentially tapered gap between the first and second conductive plates.

10. The device ~~A tunable phase shifter~~ according to claim 1, wherein:

the first conductor is insulated from the waveguide and includes an RF ground; and

the second conductor is electrically connected to the waveguide.

11. The device ~~A tunable phase shifter~~ according to claim 10, further comprising an impedance matching section formed by a gap between the first and second conductors.

12. The device ~~A tunable phase shifter~~ according to claim 11, wherein the impedance matching section comprises:

an exponentially tapered gap between the first and second conductors.

13. The device ~~A tunable phase shifter~~ according to claim 1, wherein the tunable dielectric layer comprises a material selected from the group of:

barium strontium titanate, barium calcium titanate, lead zirconium titanate, lead lanthanum zirconium titanate, lead titanate, barium calcium zirconium titanate, sodium nitrate, $KNbO_3$, $LiNbO_3$, $LiTaO_3$, $PbNb_2O_6$, $PbTa_2O_6$, $KSr(NbO_3)$, $NaBa_2(NbO_3)_5$, KH_2PO_4, and combinations thereof.

14. The device ~~A tunable phase shifter~~ according to claim 1, wherein the tunable dielectric layer comprises a barium strontium titanate (BSTO) composite selected from the group of:

BSTO-MgO, BSTO-$MgAl_2O_4$, BSTO-$CaTiO_3$, BSTO-$MgTiO_3$, BSTO-$MgSrZrTiO_6$, and combinations thereof.

15. The device ~~A tunable phase shifter~~ according to claim 1, wherein the tunable dielectric layer comprises a material selected from the group of:

Mg_2SiO_4, $CaSiO_3$, $BaSiO_3$, $SrSiO_3$, Na_2SiO_3, $NaSiO_3$-$5H_2O$, $LiAlSiO_4$, Li_2SiO_3, Li_4SiO_4, $Al_2Si_2O_7$, $ZrSiO_4$, $KAlSi_3O_8$, $NaAlSi_3O_8$, $CaAl_2Si_2O_8$, $CaMgSi_2O_6$, $BaTiSi_3O_9$ and Zn_2SiO_4.

16. The device ~~A tunable phase shifter~~ according to claim 1, wherein the tunable dielectric layer comprises:

an electronically tunable dielectric phase and at least two metal oxide phases.

17. The device ~~A tunable phase shifter~~ according to claim 1, wherein the tunable dielectric layer has a dielectric constant at zero bias voltage ranging from 30 to 2000.

18. The device ~~A tunable phase shifter~~ according to claim 1, wherein the a finline substrate comprises:

a low loss, low dielectric material.